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Recombinant birch pollen allergens (rBet v 1 and rBet v 2) contain most of the IgE epitopes present in birch, alder, hornbeam, hazel, and oak pollen: a quantitative IgE inhibition study with sera from different populations.

Niederberger V, Pauli G, Gronlund H, Froschl R, Rumpold H, Kraft D, Valenta R, Spitzauer S

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BACKGROUND: Pollen from trees of the order Fagales are important allergen sources in most parts of the world. Clinical, immunochemical, and molecular biology studies indicate that they contain cross-reactive allergens. The major birch pollen allergen, Bet v 1, and birch profilin, Bet v 2, a highly cross-reactive allergen, have been cloned and expressed in *Escherichia coli*. **OBJECTIVE:** The purpose of this study was to demonstrate the presence of allergens in Fagales pollens that share IgE epitopes with recombinant Bet v 1 and Bet v 2 and to determine the percentage of birch, alder, hornbeam, hazel, and oak pollen-specific IgE that can be preabsorbed with rBet v 1 and rBet v 2 from 102 sera of different populations of subjects allergic to Fagales tree pollen. **METHODS:** The presence of rBet v 1- and rBet v 2-homologous allergens in tree pollen extracts was investigated by IgE immunoblot inhibition experiments, and the percentage of tree (birch, alder, hornbeam, hazel, and oak) pollen-specific IgE that was bound by a mixture of rBet v 1 and rBet v 2 was determined by RAST-based quantitative IgE inhibition experiments. The clinical significance of IgE antibody cross-reactivity was studied by skin prick testing with rBet v 1, rBet v 2, and Fagales pollen extracts. **RESULTS:** Natural birch, alder, hornbeam, hazel, and oak pollen contain allergens that share IgE epitopes with rBet v 1 and rBet v 2. A combination of rBet v 1 and rBet v 2 accounted for 82% of tree pollen-specific IgE on average. Most of the tree pollen-specific IgE was directed against rBet v 1. **CONCLUSION:** rBet v 1 and rBet v 2 contain most of the Fagales pollen-specific IgE epitopes and may therefore substitute natural tree pollen extracts not only for diagnosis but also for patient-tailored immunotherapy of tree pollen allergy.

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